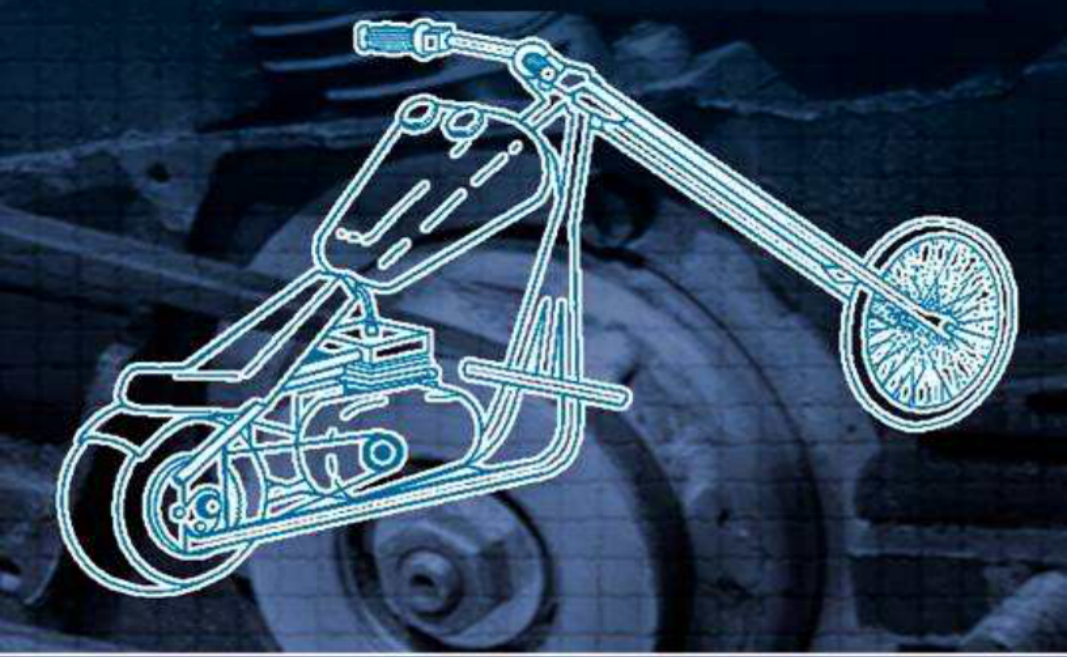
# How To Build A Mini Chopper!

## A Basic Guide To Building A Mini Chopper or Mini Bike



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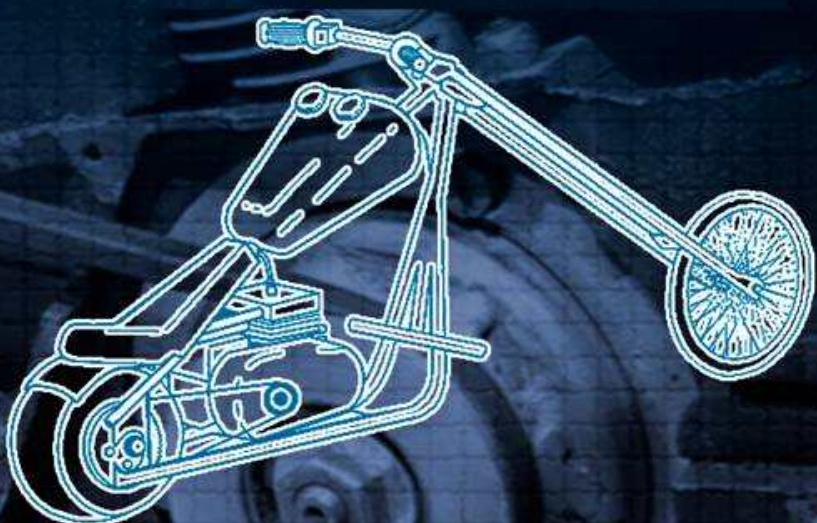

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# Introduction

So, you want to build a custom mini chopper? Well, building a machine from scratch is no easy task, even when some of the moving parts are purchased preassembled. So, before you spend a bundle of money on a tube bender and welding set-up, be sure to do your research and consider your options.

This manuscript gives an overview of how to build a mini chopper and is mainly for research purposes. This text does not constitute a specific set of plans. Plan specifics vary as wildly as the individuals who build these machines, and they are guarded secrets among professionals.

Although you can find mini chopper plans for sale, beware of such plans. First of all, they will make your bike just like that of anyone else who uses them. Secondly, such plans are often not reliable science, but instead, they are like an old family recipe that never tastes quite right when made by someone else. A custom bike is just that… custom. Many of the measurements must be fudged to fit specified parts and assemblies.

Before buying anything, the first decision you need to make concerning your project is to what degree you are building this bike and to what degree you are assembling it. If you are new to such projects, it is strongly recommended that you do an assembly job, purchasing pre-constructed parts such as the frame, front end, axel set-up, etc. You may even want to start with an assembled bike, strip it, and rebuild it with customized parts.

If you are planning to build a bike from scratch, then you will need to begin by cutting and bending the piping for the frame, then assembling the frame in a custom-made jig. For this, you will need access to a tube-bender, welder, and the professional skills to use both.

Before you decide which route to take, read this document and discuss your potential project with an experienced professional.

# Full Bike Kits

One option in building a mini chopper is purchasing a full bike kit. There are two basic kinds of kits:

**Stage I Kits include:**

- large scale plan
- detailed building instructions
- axle plates
- steering neck tube
- pre-cut and pre-bent tubing (without the connection miter cuts)

**Stage II Kits include:**

- large scale plan
- detailed building instructions
- axle plates
- steering neck tube
- pre-cut and pre-bent tubing (with the connection miter cuts)
- pre-drilled mount plates for the motor
- transmission
- oil tanks
- forward controls

If motorcycle building is a new field for you, then a kit is a wise choice.

# The Frame

You have three basic options when it comes to obtaining a frame for your mini chopper.

1. Purchase an existing cycle and strip it down to the bare frame.
2. Purchase a pre-manufactured frame.
3. Build a frame from scratch.

For first time builders, the first method is highly recommended. It is a valuable learning experience to strip a bike. You can see, as you take it apart, how it was put together. Plus, modifying an existing bike is usually far less expensive and complicated than building one.

The second option above is a good option for someone wanting to try his hand at building a bike from the bottom up without dealing with the issues of tube-bending and welding. Instead of building from scratch, you are assembling from parts. There are some great kits available for mini choppers. There are frame kits, front end kits, and full bike kits (discussed earlier).

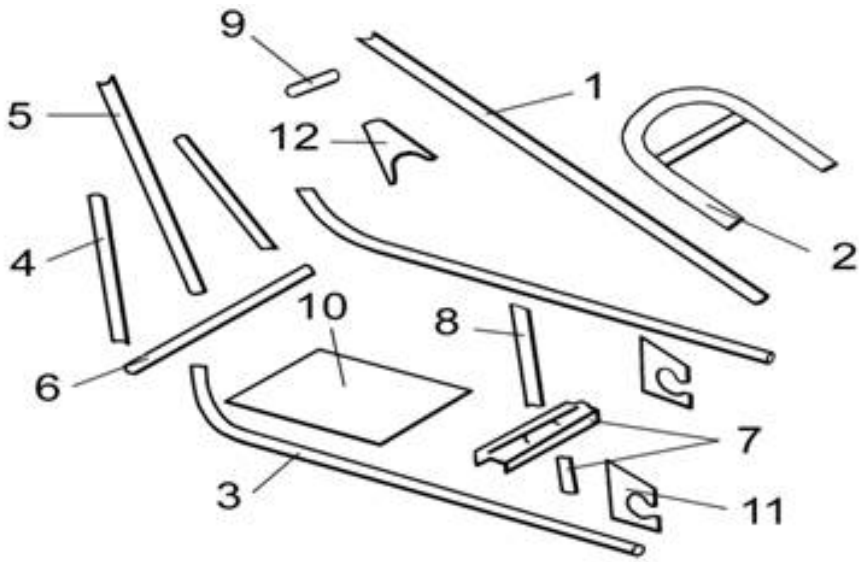
The third option is obviously the most complicated and time consuming of the three options. For this option you will need the following parts:

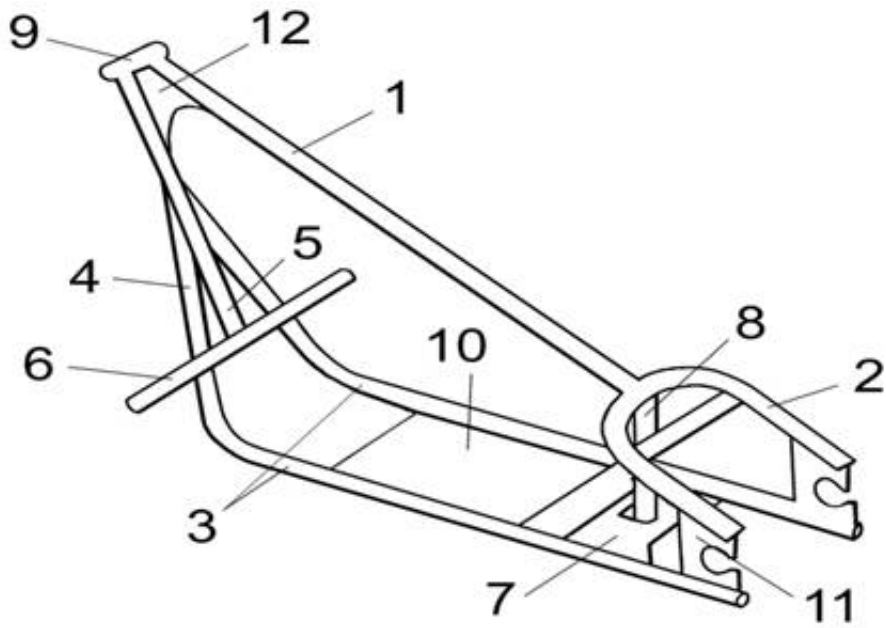
**Frame Items for Construction**

(Items do not correspond to numbers in illustrations below.)

| | |
|---|---|
| Axel Hangers | Purchase or construct |
| Engine mount plate | Purchase or construct |
| Fender mount brackets | Construction necessary |
| Fender supports | Construction necessary |
| Frame D.O.M. (tubing) | Purchase |
| Front Gusset | Construction necessary |
| Steering Neck D.O.M. | Purchase or construct |

As for tubing, D.O.M. tubing is recommended for its true diameter. An imperfect diameter will result in weak bends.





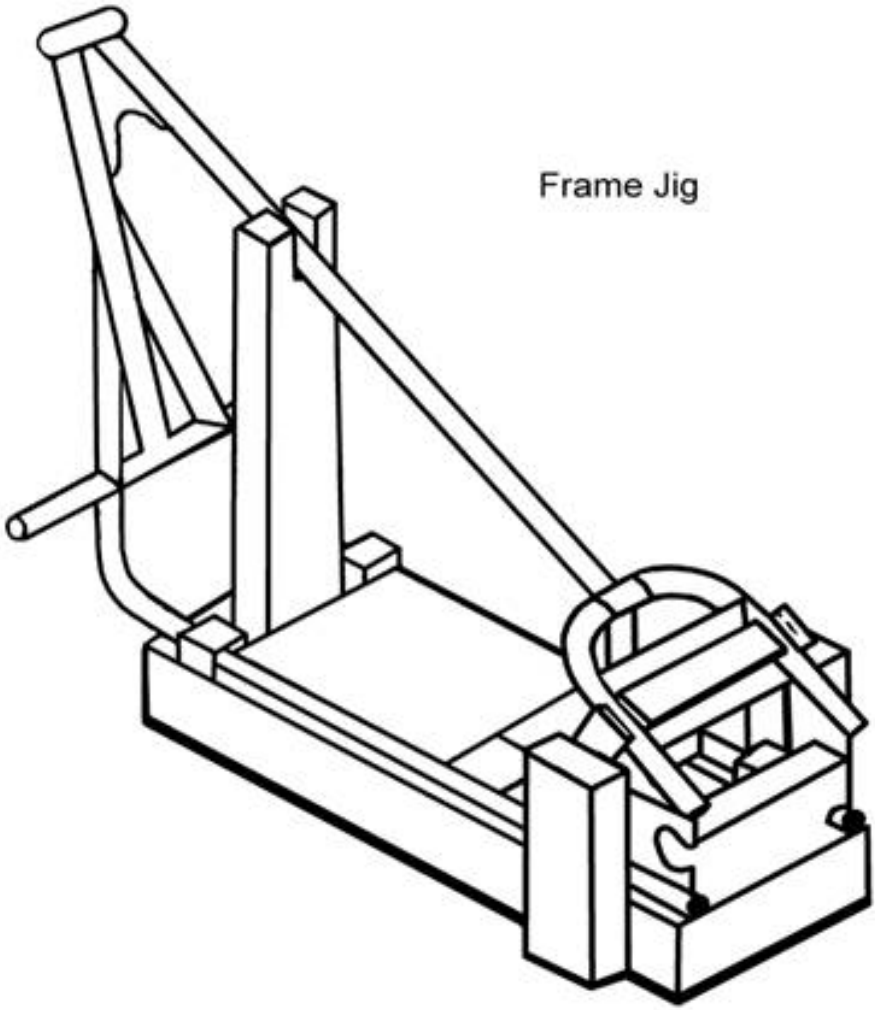

The two pieces labeled #3 and the piece labeled #6 can be cut and bent first. These can be assembled in the base of the jig (discussed in the next section). The remainder of the pieces can be measured and bent as the frame is being suited to the jig. This will allow for accurate measurements and balanced assembly.

For pieces #3, you can use a length of between 37 and 40 inches (what ever length you decide, make the two pieces identical). Then, you can bend them at 75°. For piece #6, you can use a length of between 18 and 19 inches.

When assembling the frame in the jig, tack welds are recommended so that adjustments can be made if necessary.

# The Jig

Using a jig is absolutely crucial for frame assembly. The jig will ensure that your frame is straight and accurate.



Many first-timers believe the jig must be extremely accurate and built with minute precision. At the same time, they believe the jig must possess great strength for bending tubing and holding it in position for welding. This is not the case.

You can use any relatively stable structure as the backbone of a jig. A homemade jig is as uniquely constructed as a custom bike.

If you are not comfortable constructing a jig, and you want to make sure your frame construction is solid (which is necessary), then you can buy a jig (or even borrow one). Many jigs are made to be adjusted to fit the specs of different frames.

There are three basic types of jigs for welding motorcycle frames.

## Full Bike Jig

This kind of jig is designed to accept the many components for the bike, such as wheels, engine and transmission case.

## Frame Jig

This kind of jig is designed specifically for holding the frame tubes in position while you weld. This type of jig has very little flexibility for custom work.

## Fixture Jig

This kind of jig is designed for holding a specific portion of the frame. It is essentially a sub-jig, holding specific pieces, such as the engine mount plate.

# The Front End

When it comes to front ends, there's no perfect formula. A certain amount of experimentation is always needed to suit the individual bike and the individual rider. Riding and handling characteristics are, to a certain degree, a matter of taste and preference. Plus, the fork system is not the only factor in the riding and handling. Other factors include weight distribution, total weight, neck height, tire and wheel size, etc.

The most common question concerning front ends is, "How long do the forks need to be for a particular rake?" The answer, though, depends upon a wide variety of factors and is almost always specific to one particular cycle. It is possible to use a CAD program to compute the length, but this will not work as well as actually making a mock-up of the bike, which consists of setting the frame on blocks of cribbing to get the frame level with the desired amount of ground clearance. At this point, you can measure through the steering head to the imaginary front axel.

The mock-up measurement is, of course, an imperfect science, and these measurements usually come out short due to a number of factors, including misplacement of the imagined centerline and a lack of considering fork offset. Thus, it is a good idea to add two inches the length you estimate, maybe more; it is better to err on the long side than the short side. You can always cut them down.

There are basically four different types of forks available today.

## Rigid

With rigid forks, there are no suspension links because the side rails or tubes are bolted solidly to the yokes or trees. These lack effective cushioning except on bikes with extreme amounts of rake and relatively low steering neck heights.

## Telescopic or Hydraulic

Most bikes on the road use telescopic, or hydraulic, forks, which have

been often compared to two giant pogo sticks. These forks, though, don't work extremely well on radically raked front ends.

## Springers

There are several derivatives of Springer forks, but basically they are built with springs to give them shocks.

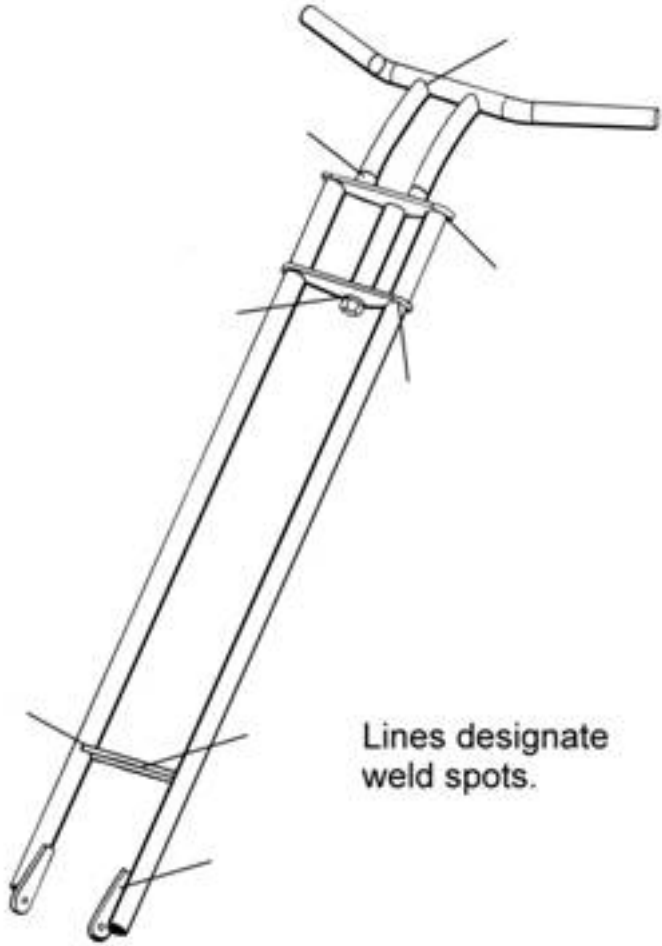
## Girders

Girder fork designs are adaptable to virtually any chassis. They provide excellent handling characteristics over a broad range of steering neck rake angles. And they can be very strong, yet lightweight. The only reason that Girders aren't on more bikes is because they are expensive to manufacture and should be custom made for a specific frame configuration.

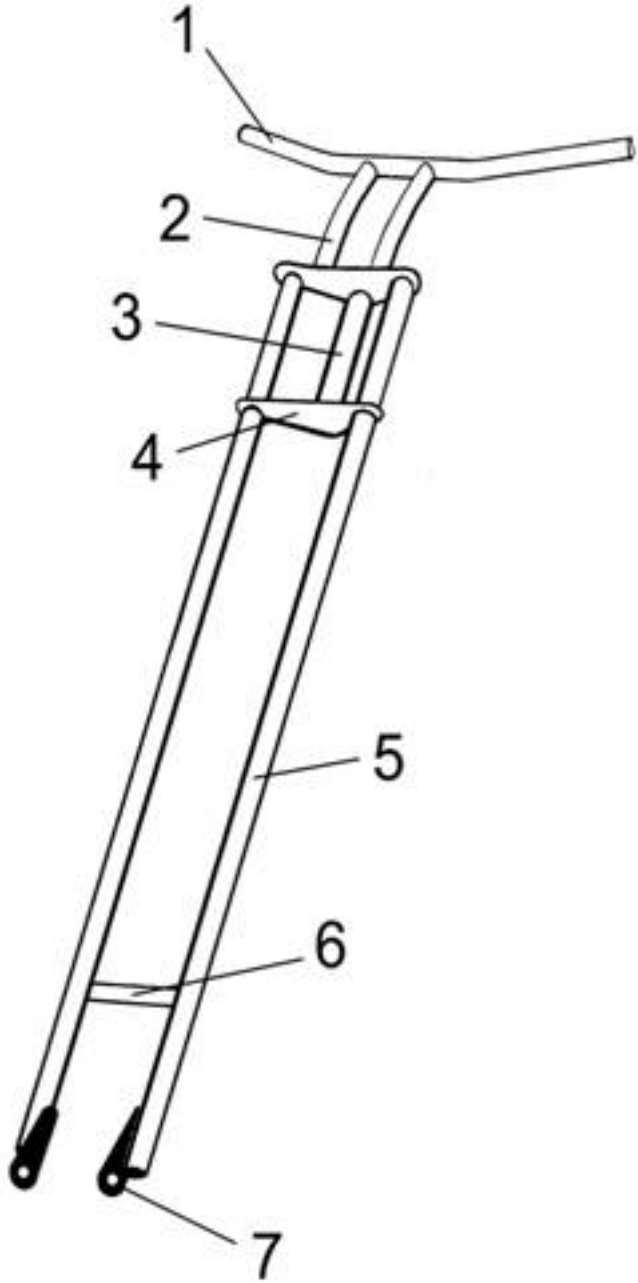
### Front End Items for Construction

(Numbers in list do correspond with numbers in illustration below.)

| | |
|---|---|
| 1. Handle bars | Purchase or construct |
| 2. Handle bar risers | Purchase or construct |
| 3. Triple Trees | Purchase or construct |
| 4. Plate | Construction necessary |
| 5. Front fork tubes | Construction necessary |
| 6. Support Brace | Construction necessary |
| 7. Front tire mount brackets | Purchase or construct |



Lines designate
weld spots.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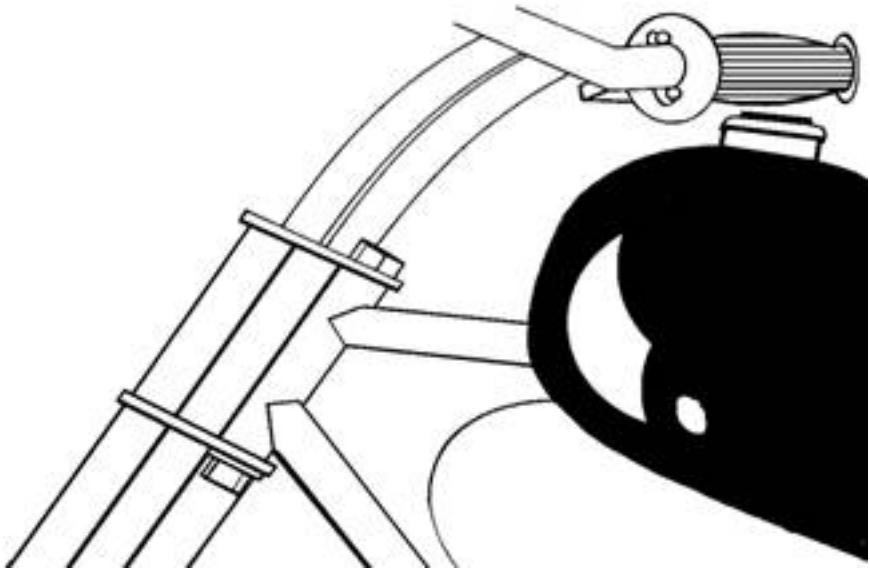


# Drive Train

As for your drive train, you have two viable options, a jack shaft drive or a torque converter drive.  The latter is shown here.

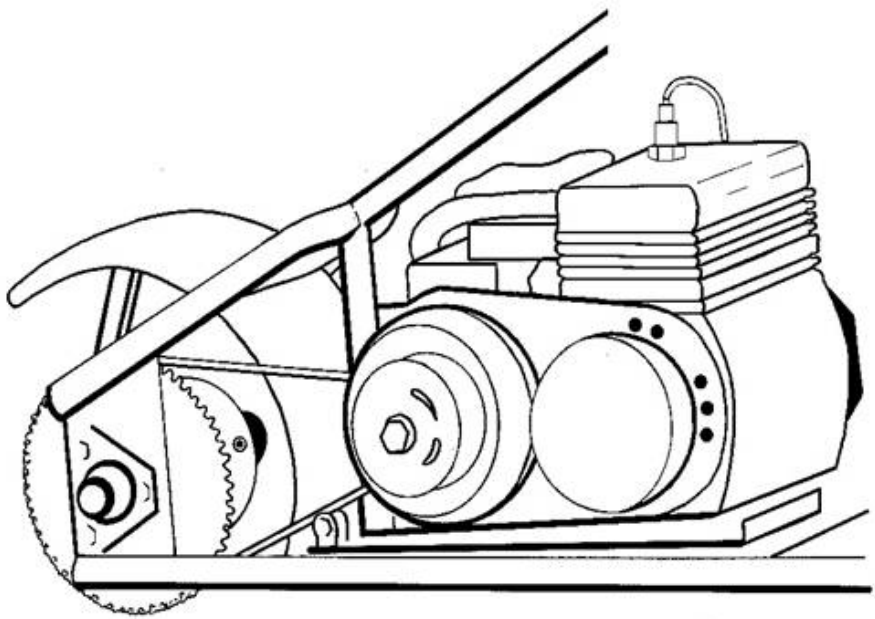
## Engine Drive Train Items

| | |
|---|---|
| 3.5hp – 6hp side shaft engine | Purchase |
| Chain length to suit option 1 or 2 | Purchase |
| Option #1 standard clutch & jack Shaft set-up | Purchase |
| Option #2 belt driven torque-Converter set-up | Purchase |

## *Torque Converter*

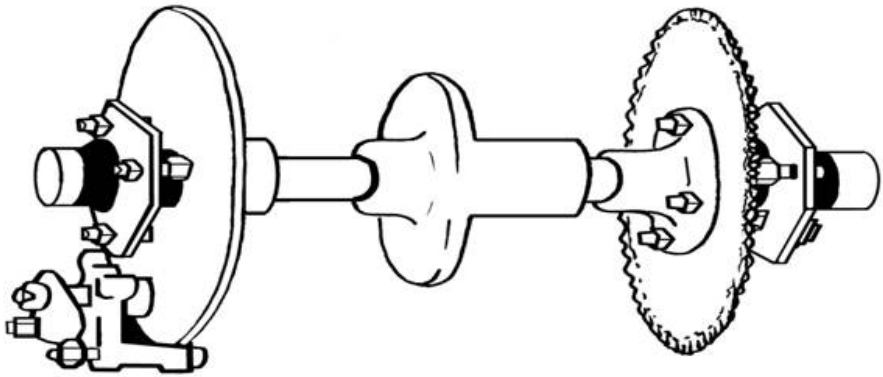
A torque converter set-up is to be purchased complete with everything you need for mounting and operating. Basically, you will mount the primary drive pulley to the shaft of your engine using the provided bolts. You may also want to add a roller to keep the chain from rubbing the frame.

The torque converter offers lower gears (meaning greater torque and acceleration) and higher gears (meaning potential higher top speeds). Yet, these qualities may not be desirable. It's, of course, a decision that each individual must make.



# Rear Axel

Below is an axel set-up.



The most common axle set-up used on mini choppers is a live-axle. The word "live" means that the axle spins along with the wheel and sprocket, and bearings must be mounted to the swing arm frame.

This set-up is simple with easily changeable components. Each piece (sprocket, wheel hub, disc brake rotor, etc.) slides onto the axle and is held in place by locking collars.

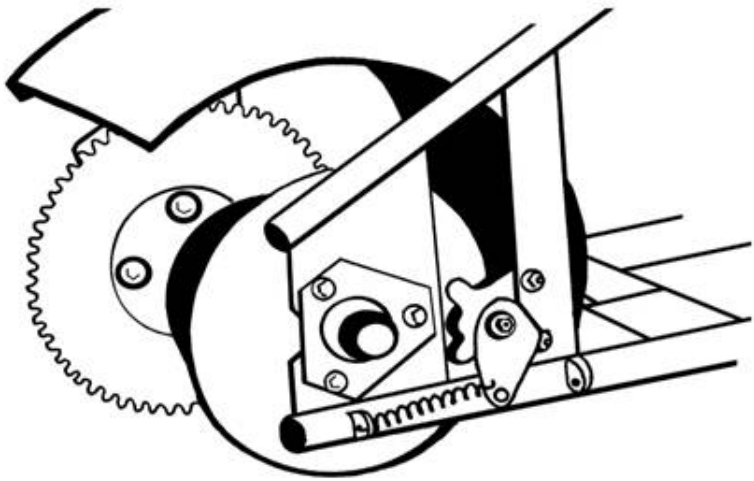
You can purchase complete live-axel kits with assembly instructions included.

## Rear Wheel Items for Assembly

| | |
|---|---|
| 1" Diameter bearings | Purchase |
| 1" Diameter live axel with retainers | Purchase |
| Axel hangers | Purchase |
| Bearing cages | Purchase |
| Front brake lever and cable | Purchase |
| Rear disc | Purchase |
| Rear disc hub | Purchase |
| Rim hub | Purchase |
| Rear tire size 18.8-8.5-8 for wide tire Frame or 15-6.00-6.00 for medium tire frame | Purchase |
| Rear Rim 4 bolt | Purchase |
| Rear sprocket | Purchase |
| Rear sprocket hub | Purchase |
| Throttle assembly | Purchase |

# Rear Brake

Here is a mechanical brake caliper.



**Clutch Band**

This is a common style of brake.

**Rear Drum Brake**

This is a less common option.

## Seat and Gas Tank

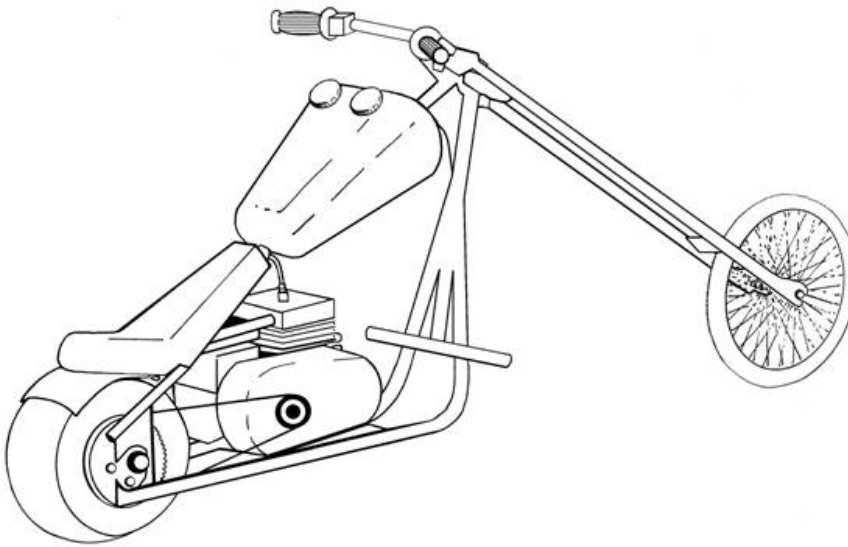
If you prefer, you can make your own seat with plywood, glue, foam, leather or vinyl.

## Custom Items

| | |
|---|---|
| Gas Tank | Purchase |
| Kick stand | Construction necessary |
| Rear fender | Purchase |
| Seat | Purchase or construct |

# Conclusion

At this point, you have some decisions to make. After deciding the path best for you, remember to plan thoroughly, measure twice and cut once, take all safety precautions and have your work checked by a professional. Be responsible in your building and your riding, and don't forget to have fun!



**Resources:**

Mini Chopper Plans: http://minichopperplans.com/

Chopper Plans: http://www.custom-choppers-guide.com

Mini Chopper Parts:  eBay or Craigslist.

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